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(54) IMPROVEMENTS IN OR RELATING TO
WINDSCREEN WIPER BLADES

- (71) I, KENNETH JENKINSON MEADOWS, a British Subject of 52, Litherland Park, Litherland, Liverpool, L21 9HR, Lancashire, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:
- The present invention relates to wind-screen wipers, and particularly to wind-screen wiper blade and refill units.
- The majority of windscreen wiper blades in use on various types of vehicle, have a single wiping lip which actually clears the screen of water and other foreign matter which may obscure a driver or pilot's view. However, there are one or two sophisticated designs of wiper blade known, which are each composed of several separate blade elements each having its own wiping lip.
- According to the present invention there is provided a windscreen wiper refill unit comprising a blade and a support member, the blade being of integral construction and having in cross-section a subsidiary wiping lip extending from each side of a central main wiping lip of generally triangular cross-section, in the same general direction as said main wiping lip.
- A wiper blade constructed in accordance with the present invention will, it is envisaged, provide for a double wipe of a windscreen for each sweep of the blade. As the blade sweeps across the windscreen the main wiping lip will bend so bringing one of the subsidiary wiping lips into contact with the windscreen and providing for a preliminary wipe of the screen just before the main wipe of the central wiping lip; thus more efficient cleaning of the windscreen may result, especially in snowy or muddy conditions.
- In a preferred embodiment of the present invention the central main wiping lip will be of generally triangular cross-section with a subsidiary wiping lip also of generally triangular cross-section, extending out on either side for a full length of the blade. The three wiping lips merge into the body of the wiper blade and the top of the blade has a hinge and a support member retainer portion attached thereto. The support member retainer portion of the blade will preferably be of substantially rectangular configuration with a thin hinge portion integrally connecting the middle of the bottom of the retainer portion with the top of the wiper blade body.
- In the preferred embodiment, the support member will be in the form of two elongated strips of metal adapted to fit one on either side of the hinge portion of the blade between the retainer portion and the top of the blade body. These strips will be retained in position by clips which are adapted to engage the end of the wiper blade and lock in a recess in the region of the ends of both the metal strips. This is one form of support member, but various constructions may be used with the blade constructed according to the present invention.
- It is also envisaged that the metal strips of the support member may be bent or rather curved towards one end, so that when they are engaged on either side of the hinge portion of the blade, they give a preset curve to one end of the blade. This preset curve, it is envisaged, will provide for a better wipe of the curved surfaces of a curved windscreen, at the outer extremities of a wiper blades sweep. Any suitable construction of support member may be bent to give this preset curvature of the blade and thus provide for a better or rather more efficient wipe of the curved windscreen.
- In the preferred embodiment of the present invention, the subsidiary wiping lips will be somewhat shorter than the central

main wiping lip, but in alternative embodiments, the subsidiary wiping lips may be constructed so that they are only slightly shorter than the main wiping lip. In the preferred embodiment the central wiping lip will therefore have to bend over a considerable amount before a subsidiary wiping lip contacts the screen.

The subsidiary wiping lips are preferably shorter and slightly more rigid than the central main wiping lip, so that when they contact a windscreen they do not bend and compress flat against the main wiping lip, but do in actual practice rest on the screen leaving a gap between the tip of the subsidiary wiping lip and the main wiping lip, thus providing for a preliminary wipe of the screen before that of the main wiping lip. It is envisaged that the windscreen wiper refill unit constructed in accordance with the present invention will be attachable to the majority of wiper blade main supports already on automotive vehicles. Alternatively the refill unit of the present invention may be supplied in combination with a suitable main support adapted to be attached to a wiper arm of a vehicle.

The present invention will now be further described, by way of example, with reference to the drawings accompanying the Provisional Specification in which:—

Fig. 1 is a cross-sectional view of a windscreen wiper blade constructed in accordance with the present invention, and

Fig. 2 is an exploded perspective view of one embodiment of a refill unit incorporating a wiper blade constructed in accordance with the present invention.

In Fig. 1 of the accompanying drawings is illustrated a cross-sectional view of a wiper blade 1, having a central main wiping lip 2 with subsidiary wiping lips 3 extending on either side of the main lip 2 for the full length of the blade. The subsidiary wiping lips 3 are angled away from the main wiping lip 2 and are somewhat shorter than the main lip.

The wiper blade has a support member retaining portion 4 which is generally rectangular in cross-sectional shape, and the bottom of which is attached to the middle of the top 5 of the wiper blade body by a flexible hinge portion 6. The whole wiper blade and support member retaining portion is of integral construction and is made from a resilient elastomeric material.

In Fig. 2 of the accompanying drawings is illustrated an exploded perspective view of a windscreen wiper refill unit constructed in accordance with the present invention. The support member 7 is in the form of two elongated metal strips 8 which engage on either side of the hinge portion 6 between the top 5 of the blade and the bottom of the retainer portion 4, clips 9

and 10 engaging the ends of the blade and locking in recesses 11 provided in the region of the ends of the metal strips 8.

The clips 9 and 10 each have a flat body portion 12 which has two opposing lateral flaps 13 which are bent back on themselves to form spaces 14 which each engage a recess 11 of a metal strip 8. Each clip also has a downwardly projecting end flap 15 which locates the clips at the ends of the wiper blade. Thus when the metal strips 8 are in situ on either side of the hinge portion 6, the lateral flaps 13 of the clips lock into the recesses 11 and the end flaps 15 hold the support member to the blade preventing the metal strips from sliding along the hinge 6.

A refill unit as described hereinabove can then be attached to a harness which flexibly attaches the blade to a wiper arm on the vehicle. The support member could have various constructions but must prevent the blade 1 from bending about a vertical axis (Fig. 1, Line A-A) though allowing the blade to bend and mould to a windscreen surface about a horizontal axis (Fig. 1, Line B-B).

The blade will bend about its neck region 18 and also about the hinge portion 6, the natural resilience of the elastomeric material from which it is made, preventing the blade from bending right over so that the main wiping lip 1 does not contact the windscreen. The extremities of the blade top 5 are also so dimensioned that they extend beyond the support member 7; thus if the blade does bend or compress under extreme pressure, the metal support member will not contact and damage the windscreen.

The support member can be bent or rather curved towards one end so that when locked to the blade 1, it gives the blade a preset curvature towards one end. This will provide for a more efficient coverage of the extremities of the sweep of a blade over a curved windscreen, and any suitable form of support member can be bent to produce the required curvature of a blade towards one end.

The present invention, described hereinabove will provide for a double wipe of the windscreen for each sweep of the blade, one of the subsidiary wiping lips wiping the windscreen just before the main wiping lip for either direction of sweep, and thus giving a more efficient wiping of the windscreen, especially in snowy or muddy conditions.

The windscreen wiper refill units can be constructed of varying lengths, to give the optimum amount of coverage for any particular windscreen.

Also the actual length of the subsidiary wiping lips can be varied so long as they

do not project beyond the central main wiping lip; though they are preferably somewhat shorter than the main lip and of sufficient thickness to give them a rigidity which prevents them from bending and compressing into the main wiping lip when in use. This is so that they do present an actual wiping lip to the windscreen, leaving a small space between the subsidiary wiping lip and the main lip.

The windscreen wiper refill unit may be attached to the majority of the different designs for main wiper blade supports already mounted on automotive vehicles.

Alternatively, the refill unit can be supplied in combination with a suitable main support which is adapted to be attached to a wiper arm of a vehicle.

WHAT I CLAIM IS: —

1. A windscreen wiper refill unit comprising a blade and a support member, the blade being of integral construction and having in cross-section a subsidiary wiping lip extending from each side of a central main wiping lip of generally triangular cross-section, in the same general direction as said main wiping lip.

2. A windscreen wiper refill unit as claimed in claim 1, in which each subsidiary wiping lip is of generally triangular cross-section.

3. A windscreen wiper refill unit as claimed in claim 1 or claim 2, in which the subsidiary wiping lips extend out on either side of the central wiping lip for the full length of the blade.

4. A windscreen wiper refill unit as claimed in any one of claims 1 to 3, in which a support retainer portion is integrally attached via a hinge portion, to a part of the blade remote from the central main wiping lip.

5. A windscreen wiper refill unit as claimed in claim 4, in which the support member retainer portion is of substantially rectangular cross section, the hinge portion integrally connecting the middle of the bottom of the retainer portion to the blade.

6. A windscreen wiper refill unit as claimed in claim 4 or 5 in which the support member is in the form of two elongated strips adapted to fit one on either side of the hinge portion of the blade, the strips being retained in position by clips which are adapted to engage the end of the wiper blade and adjacent end regions of the strips.

7. A windscreen wiper refill unit as claimed in claim 6, in which the strips are bent or curved towards one end.

8. A windscreen wiper refill unit as claimed in claim 6 or 7 in which the clips engage in recesses in the end regions of the strips.

9. A windscreen wiper refill unit as claimed in any one of the preceding claims in which the subsidiary wiping lips are shorter and more rigid than the central main wiping lip.

10. A windscreen wiper refill unit as claimed in any one of the preceding claims in which the blade is integrally constructed from a resilient elastomeric material.

11. A windscreen wiper refill unit as claimed in claims 6, 7 or 8 in which the strips are constructed of metal.

12. A windscreen wiper refill unit comprising a blade and a support member, the blade being of integral construction and having in cross-section a subsidiary wiping lip extending from each side of a central main wiping lip of generally triangular cross-section, in the same general direction as said main wiping lip, the blade and support member being attached to a main support adapted to be connected to a wiper arm.

13. A windscreen wiper refill unit, constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the drawings accompanying the Provisional Specification.

W. P. THOMPSON & CO.
12, Church Street, Liverpool, L1 3AB
Chartered Patent Agents.

